UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,527	11/28/2003	Simon Ryder	245841US2	7603

22850 7590 02/07/2005

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
KRAMSKAYA, MARINA	

ART UNIT	PAPER NUMBER
2858	

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/722,527	RYDER, SIMON	
	Examiner	Art Unit	
	Marina Kramskaya	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 28 November 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 02/25/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: the impedance **Z1** and impedance **ZI** appear on page 2, line 19. The drawing show **Z1**'s only; therefore, it is unclear if there are several impedance values represented.

The "gain k" equation is described in terms of **ZT**; however **ST** is printed in the equation on page 2, line 19.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coleman et al, US 4,857,856, in view of Wang et al, US 6,466,034.

As per Claim 1, Coleman discloses a method of diagnosing a fault on a transformer winding, the method comprising the following steps:

- measuring the impedance on said winding (of transformer **1**) as a function of frequency (column 2, lines 49-53), said measurement being represented in the form of a first voltage (column 3, lines 29-30) .
- calculation of the voltage gain is taught by Coleman, since Coleman discloses measuring the input and output voltage signals (column 3, lines 29-30, FIG. 3).
- Coleman further discloses comparing the signal of the transformer under test to a signal of a new (reference) transformer winding (column 4, lines 12-22).

Coleman does not disclose:

- comparing said impedance measurement with a reference measurement represented in the form of a second voltage gain, and calculating a correlation coefficient, between said first and second gains over three different frequency ranges;
- determining the relative variation of at least a fourth parameter, said fourth parameter being a physical magnitude characteristic of said transformer, said relative variation being obtained by comparing said first and second gains.

Wang discloses:

- comparing said impedance measurement (as represented by a voltage gain above) with a reference measurement represented in the form of a second voltage gain (FIG. 7),

- calculation of the voltage gain is taught by Wang, since Wang discloses measuring the input and output and voltage signals (column 4, lines 55-57).
- and calculating a correlation coefficient, between said first and second gains over three different frequency ranges (selected from a total range of 1 kHz to 20 MHz, column 1, lines 9-10).
- said method comprising a step of determining the relative variation of at least a fourth parameter, said fourth parameter being a physical magnitude characteristic of said transformer, said relative variation being obtained by comparing said first and second gains (column 7, line 40, FIG. 6-7).

Therefore, it would have been obvious to a person of ordinary skill in the art to determine a correlation between a reference winding and the winding under test and take into account a fourth parameter represented by a physical variable, as taught by Wang, in the testing method of Coleman in order to observe winding fault (such a deformation of excessive vibration) over time (Wang: column 1, lines 29-37).

As per Claims 2-3 & 5-6, Coleman in view of Wang discloses a method of testing transformer as applied to Claim 1 above. Coleman further discloses resonance measurements (column 3, line 32; column 4, lines 2-8)) from which fundamental resonant frequency, and number of resonant frequencies present above a predetermined frequency can be determined.

Coleman does not disclose a minimum gain parameter.

Wang discloses a minimum gain parameter on the graph of FIGs. 6-7. Further, the minimum gain parameter can be selected bellow a frequency value of 10 kHz, as seen on FIGs. 6-7.

Therefore, it would have been obvious to a person of ordinary skill in the art to select a minimum gain parameter in addition to the resonance parameters, as taught by Wang, in the testing method of Coleman, in order to provide information relevant to the type and severity of a fault.

As per Claim 4, Coleman and Wang disclose a method of testing transformers as applied to Claim 1 above, and further disclose a range of frequencies between 1 kHz to 20 MHz.

4. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coleman in view of Wang as applied to claims 1-6 above, and further in view of Mimeault et al. US 5,455,506.

Coleman in view of Wang disclose a method of testing transformers as applied to Claim 1 above.

Coleman, as modified, does not disclose:

- determining a plurality of diagnosis codes, each of said codes indicating whether a respective one of said parameters belongs to a predetermined range of values;
- determining the presence of a fault and of identifying said fault as a function of said plurality of diagnosis codes;

- determining the presence of a fault and of identifying said fault is performed by comparing said plurality of codes with codes stored in a search table.

Mimeault discloses the determination of a plurality of diagnosis codes, each of said codes indicating whether a respective one of said parameters belongs to a predetermined range of values, wherein the fault is a function of the diagnosis code (column 2-3, steps (d), (e), (f) & (i)). Further, the fault identification is performed by comparing said plurality of codes with codes stored in a search table (in code pages 10-32).

Therefore, it would have been obvious to a person of ordinary skill in the art to include the teachings of Mimeault in the testing method of Coleman and Wang in order to accurately provide a concise method of identifying types of faults and clearly identifying the windings (Mimeault, ABS).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Coffeen, US 6,549,017, discloses a method of testing transformer winding using frequency response analysis. The method including computing signature transfer functions for a transformer under test to a reference transfer function (ie. new transformer winding) and comparing the signature functions over time to detect faults such as deformation or displacement. Shuey, US 6,535,000, discloses a method of measuring impedance of a transformer winding when an AC

signal is applied. Lat et al., US 5,396,172, discloses a method of testing transformer windings relying on impedance measurement for fault analysis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571)272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marina Kramskaya
Examiner
Art Unit 2858
M. Kramskaya

MK

EDWARD LEFKOWITZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800